ABSTRACT OF THE INVENTION

Disclosed is a device for increasing entrainment and mixing in an air/fuel zone of a direct fuel injection system. The device comprises an ejector nozzle in the form of an inverted funnel whose central axis is aligned along the central axis of a fuel injector jet and whose narrow end is placed just above the jet outlet. It is found that effective ejector performance is achieved when the ejector geometry is adjusted such that it comprises a funnel whose interior surface diverges about 7° to about 9° away from the funnel central axis, wherein the funnel inlet diameter is about 2 to about 3 times the diameter of the injected fuel plume as the fuel plume reaches the ejector inlet, and wherein the funnel length equal to about 1 to about 4 times the ejector inlet diameter. Moreover, the ejector is most effectively disposed at a separation distance away from the fuel jet equal to about 1 to about 2 time the ejector inlet diameter.